

JONES BLUFF RESERVOIR
MANAGEMENT REPORT
(FALL 2005)

2005 - 2006

Prepared by

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Introduction

Crappie were previously sampled from 1989 – 2000 by Auburn University as a part of a Statewide study to characterize these species population dynamics and to help explain variable recruitment (Rider et al., 2002). The Auburn University study identified several hydrologic conditions that impact crappie year-class strength in Alabama reservoirs (Maceina et al., 2002). Historically, the crappie population in Jones Bluff has exhibited satisfactory size structure, highly variable recruitment, and rapid growth. Beginning in 1993, a 9-inch minimum size limit was placed on crappie in Jones Bluff Reservoir.

Refer to “An Angler’s Guide to Interpreting Alabama Wildlife and Freshwater Fisheries Reservoir Reports” for a detailed description of fisheries terms used in this report. The Angler’s Guide is available on the Department’s website at <http://www.outdooralabama.com/fishing/freshwater/where/reservoirs/guide.pdf>.

Methods

Crappie were collected according to the guidelines presented in the Alabama Reservoir Management Manual (1999). Twenty trap-nets were set from November 1 through November 2, 2005 (Figure 2).

Results and Discussion

A total of 128 black crappie and 453 white crappie were collected during 20 net-nights of effort during Fall 2005. The overall CPE of both black crappie (Table 2) and white crappie (Table 3) was 42 % higher than the lake average and was among the

highest since 1989. Extremely high catch-rates of crappie were also documented on Gainesville Reservoir in west Alabama during Fall, 2005 (Haffner et al., 2006).

The PSD for black crappie was 52, the RSD-P was 19, and the RSD-M was 1. The PSD for white crappie was 61, the RSD-P was 26, and the RSD-M was 10. The RSD_{S-Q} values for both species were well below the lake average, while RSD's for larger size-classes were at or above average. Almost all the crappie from the relatively strong 2004 year class have recruited to stock-size and the bulk of them will soon recruit into the fishery (9-inches).

Catch-rates for white crappie in all RSD size categories were very high, particularly among the larger size groups. Catch-rates of quality, preferred, and memorable sized white crappie were three to four times higher than the twelve-year lake average. Although a similar trend was evident among black crappie, no inferences were made due to a lack of historical data on this species.

The black crappie sample included six age-classes (Age-0 through Age-5). Young-of-year (YOY) fish comprised 27 % of the total black crappie collection. Three year-classes (2003 - 2005) comprised 95 % of the total black crappie population. Growth rates of black crappie were considerably slower than that of white crappie. Although black crappie are well established, white crappie are much more abundant and are the primary crappie species present in this system.

The white crappie sample included six age-classes (Age-0 through Age-5), and YOY fish comprised 60 % of the population. Two relatively strong year classes were identified (2004 and 2005), which comprised 89 % of the total white crappie population. The strong 2001 year-class is still evident in the population, comprising 2.2 % of the total

sample. White crappie exhibited rapid growth, particularly among the older year-classes. The 2004 year-class has already begun to recruit into the fishery (9-inches) and will quickly replace the declining 2001 year-class, which has sustained the fishery during the last three years. In addition, the 2005 year-class appears to be very strong and will further support the crappie fishery in Jones Bluff Reservoir.

Due to highly variable recruitment, mortality estimates could not be made. However, mortality rates of both black crappie and white crappie appear to be very high in this system.

Summary

The CPE of white crappie was among the highest ever recorded at Jones Bluff Reservoir and growth rates continue to be excellent. The strong 2004 and 2005 year-classes should begin to replenish the disappearing 2001 year-class that has sustained the fishery for the last several years. The majority of crappie in Jones Bluff are young, small, fast growing fish, which are beginning to recruit into the fishery; thus, crappie fishing should be excellent during the next several years.

Conclusions

1. The crappie population should be sampled in 3 to 4 years according to reservoir program guidelines.
2. Maintain the 9-inch minimum-length limit regulation on both crappie species.

Literature Cited

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- Rider, S. J., J. J. McHugh, and T. R. Powell. 2002. Jones Bluff Reservoir management report. Alabama Department of Conservation and Natural Resources. Montgomery, Ala.
- Ryder, R. A. 1965. A method for estimating the potential fish production of north-temperate lakes. Transactions of the American Fisheries Society 94: 214 – 218.

APPENDIX A

TABLES AND FIGURES

TABLE 1. - JONES BLUFF RESERVOIR MORPHOMETRIC, PHYSICAL AND
CHEMICAL CHARACTERISTICS.

Surface Area	12,510	acres
Drainage Area	3,250	sq. mi.
Full Pool Elevation	125	feet-msl
Mean Annual Fluctuation	2	feet
Shoreline Distance	368	miles
Shoreline Development Index	23.5	
Mean Depth	27.8	feet
Maximum Depth	60.0	feet
Outlet Depth	0-43	feet
Thermocline Depth	10	feet
Storage Ratio	55.2	
Total Dissolved Solids	37.3	mg/L
Morphoedaphic Index	1.3	TDS/mean depth (ft) (Ryder 1965)
Growing Season	235	frost free days (Jenkins 1967)
Reservoir Age	1975	

TABLE 2. - RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF BLACK CRAPPIE COLLECTED USING TRAP-NETS FROM JONES BLUFF RESERVOIR FROM FALL 1998 THROUGH FALL 2005.

YEAR	TOTAL	SUBSTOCK			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				TOTAL	
	EFFORT ^a	NO.	CPE	SSR ^b	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1998	40	86	2.2	205	22	0.6	53	73	14	0.4	33	79	5	0.1	12	86	1	<0.1	2	88	128	3.2
1999	40	78	1.9	181	31	0.8	72	71	7	0.2	16	79	4	0.1	9	83	1	<0.1	2	82	121	3.0
2000	40	38	0.9	90	26	0.6	62	74	11	0.3	26	82	4	0.1	10	91	1	<0.1	2	87	80	2.0
2005	20	29	1.5	29	48	2.4	48	73	32	1.6	32	78	18	0.9	18	83	1	0.1	1	86	128	6.4
LAKE AVERAGE			1.6	126		1.1	59	73		0.6	27	80		0.3	12	86		<0.1	2	86		3.7

^aTotal effort measured in net-nights

^bSSR denote substock ratio; the number of substock size fish per 100 fish stock size and larger.

TABLE 3. - RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (W_r) OF WHITE CRAPPIE COLLECTED USING TRAP-NETS FROM JONES BLUFF RESERVOIR FROM FALL 1989 THROUGH FALL 2005.

YEAR	TOTAL	SUBSTOCK			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				RSD-T				TOTAL	
	EFFORT ^a	NO.	CPE	SSR ^b	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE
1989	64	91	1.4	94	35	0.5	36	76	19	0.3	20	92	27	0.4	28	96	16	0.3	16	99					188	2.9
1990	80	634	7.9	200	181	2.3	57	72	73	0.9	23	82	44	0.6	14	91	19	0.2	6	93					951	11.9
1991	80	288	3.6	56	410	5.1	80	68	47	0.6	9	81	23	0.3	5	84	29	0.4	6	92	1	<0.1	<1	90	798	10.0
1992	80	410	5.1	106	184	2.3	47	73	123	1.5	32	87	61	0.8	16	92	20	0.3	5	92					798	10.0
1993	40	494	12.4	225	73	1.8	33	72	69	1.7	31	87	50	1.3	23	93	26	0.7	12	94	2	<0.1	1	90	714	17.9
1994	40	177	4.4	77	183	4.6	80	71	15	0.4	6	80	22	0.6	10	88	9	0.2	4	88					406	10.2
1995	40	128	3.2	110	31	0.8	27	81	55	1.4	47	95	26	0.7	22	100	4	0.1	3	102					244	6.1
1996	40	803	20.1	449	94	2.4	53	71	27	0.7	15	79	35	0.9	20	92	22	0.6	12	94	1	<0.1	1	66	982	24.6
1997	40	149	3.7	45	284	7.1	86	72	21	0.5	6	79	15	0.4	5	88	11	0.3	3	93					480	12.0
1998	40	490	12.3	340	51	1.3	36	76	61	1.5	42	86	25	0.6	17	94	7	0.2	5	89					634	15.9
1999	40	357	8.9	149	181	4.5	75	75	21	0.5	9	81	26	0.7	11	87	12	0.3	5	94					597	14.9
2000	40	171	4.3	79	97	2.4	45	79	78	1.9	36	88	35	0.9	16	91	7	0.2	3	97					388	9.7
2005	20	152	7.6	50	117	5.9	39	74	106	5.3	35	83	49	2.5	16	88	29	1.5	10	89					453	22.7
LAKE AVERAGE		7.3	152		3.2	53	74		1.3	24	85		0.8	16	91		0.4	7	94		<0.1	<0.1	82		13.0	

^aEFFORT IS IN NET-NIGHTS

^bSSR DENOTES SUBSTOCK RATIO (THE NUMBER OF SUBSTOCK SIZE FISH PER 100 FISH STOCK SIZE AND LARGER).

TABLE 4. - AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) OF BLACK CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0	2005	34	26.6	1.7	106.6	5.8	81 - 138
1	2004	54	42.2	2.7	185.0	5.6	120 - 269
2	2003	33	25.8	1.7	231.4	5.8	171 - 302
3	2002	4	3.1	0.2	226.8	13.5	206 - 264
4	2001	2	1.6	0.1	253.5	6.5	218 - 226
5	2000	1	0.8	0.1	242.0		
Total		128	100.0	6.4			

TABLE 5. - AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) OF WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0	2005	272	60.0	13.6	138.3	3.6	69 - 168
1	2004	130	28.7	6.5	207.8	3.5	102 - 314
2	2003	38	8.4	1.9	294.4	3.1	235 - 332
3	2002	2	0.4	0.1	326.5	6.5	320 - 333
4	2001	10	2.2	0.5	333.8	4.1	312 - 357
5	2000	1	0.2	0.1	291.0		
Total		453	100.0	22.7			

TABLE 6. - TIME TO RECRUIT TO EACH RELATIVE STOCK DENSITY (RSD) CATEGORY FOR BLACK CRAPPIE AND WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

<u>Black Crappie</u>		<u>White Crappie</u>
Years	RSD Category	Years
0.27	Stock	0.26
1.39	Quality	0.91
1.98	9-in. minimum length limit	1.25
2.47	Preferred	1.54
4.14	Memorable	2.47

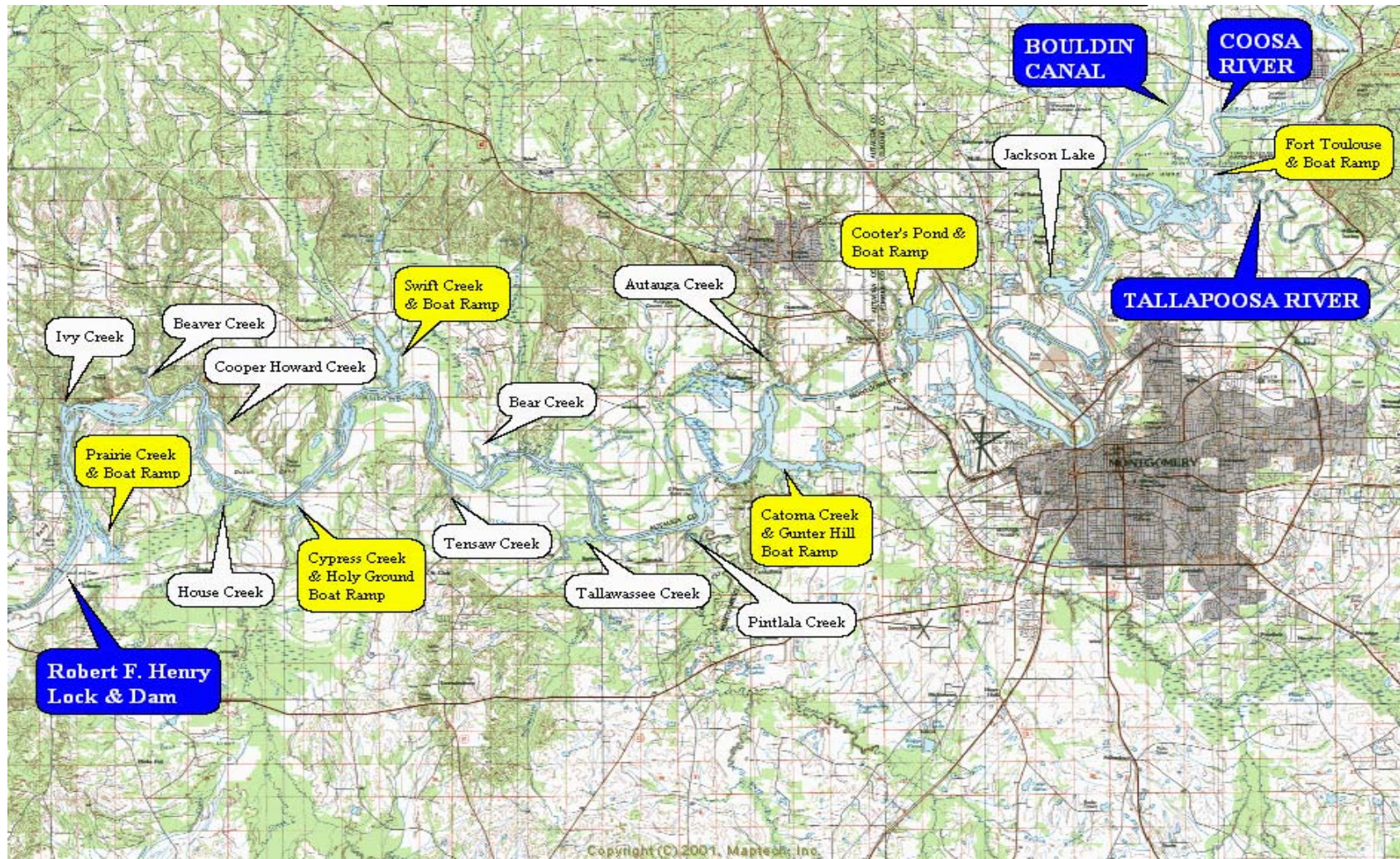


FIGURE 1. - MAP OF JONES BLUFF RESERVOIR WITH SIGNIFICANT TRIBUTARIES, FEATURES, AND ACCESS AREAS.

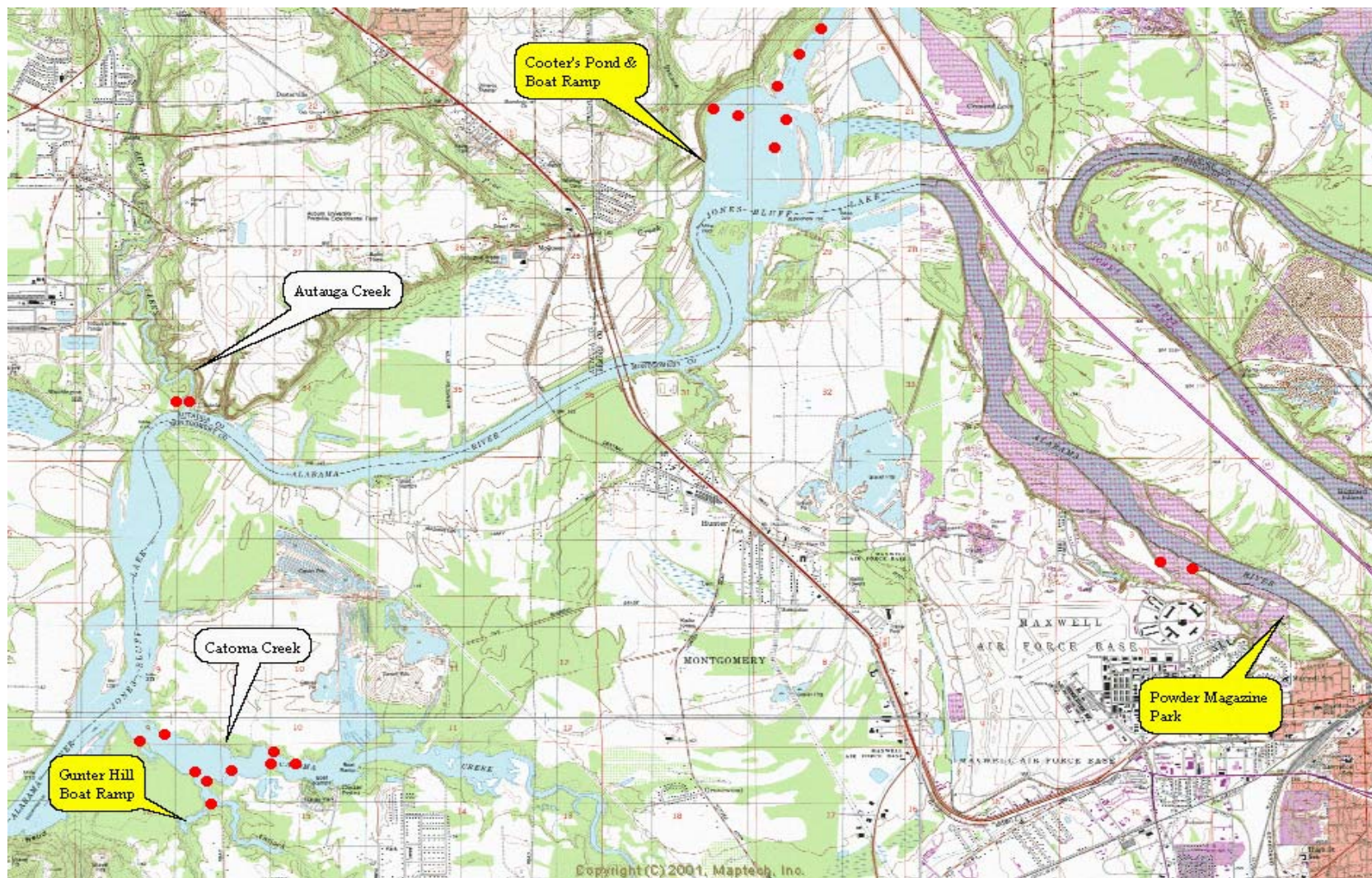


FIGURE 2. - TRAP-NET SAMPLE SITES (IN RED) AT JONES BLUFF RESERVOIR DURING FALL, 2005.

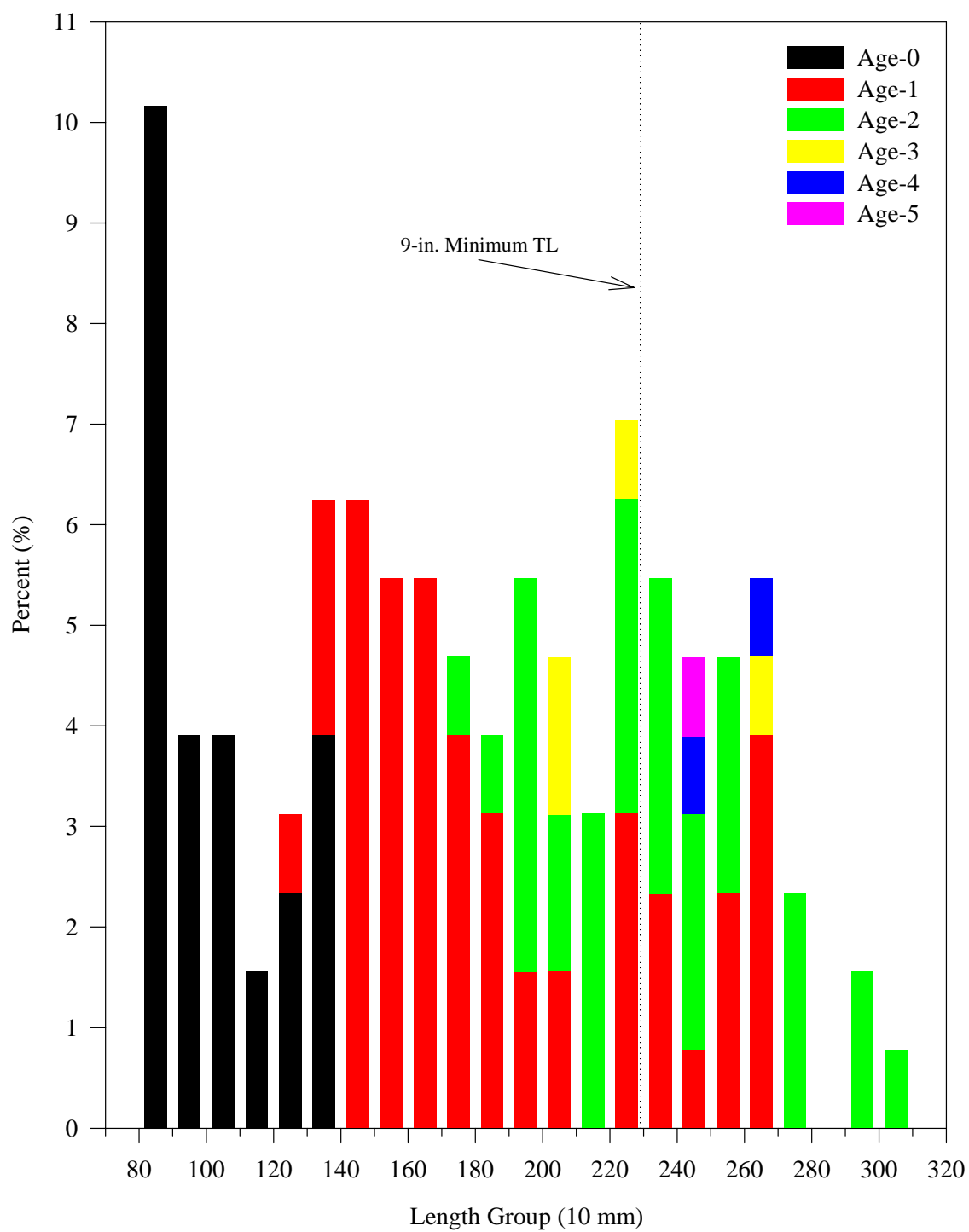


FIGURE 3. - LENGTH-AT-AGE FREQUENCY OF BLACK CRAPPIE (N=128) COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

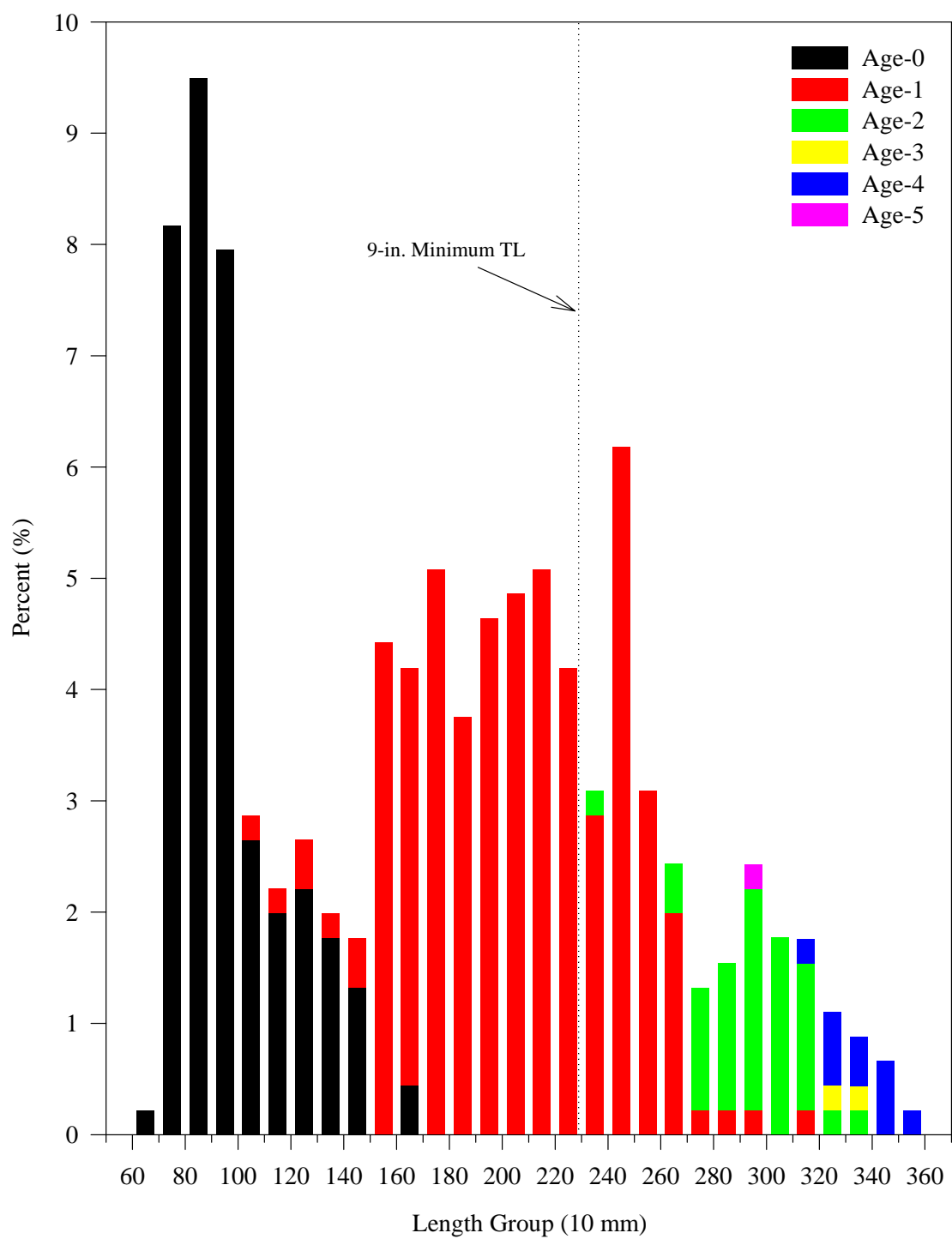


FIGURE 4. - LENGTH-AT-AGE FREQUENCY OF WHITE CRAPPIE (N = 453) COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

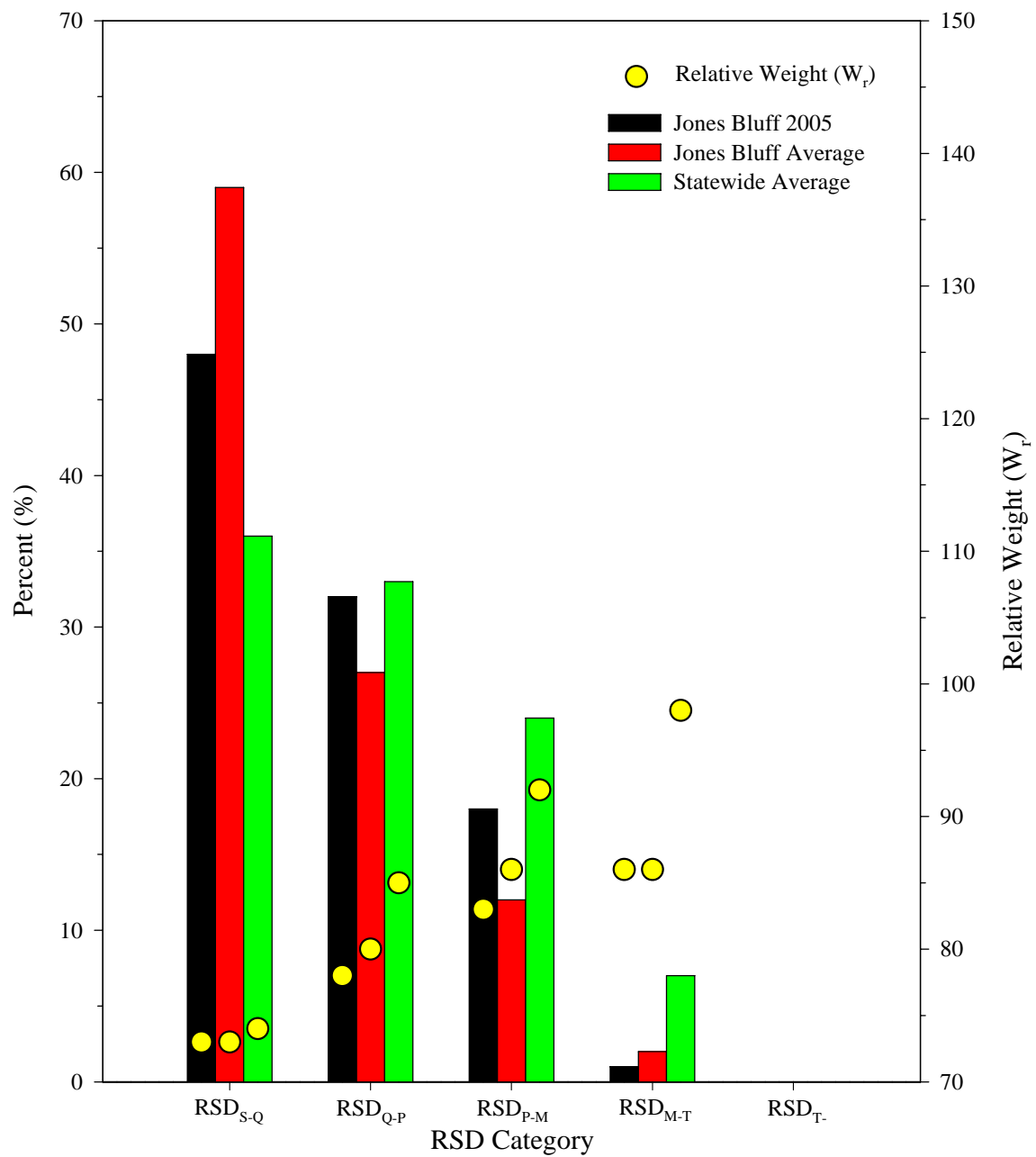


FIGURE 5. - RELATIVE STOCK DENSITY (RSD) AND MEAN RELATIVE WEIGHT (W_r) OF BLACK CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

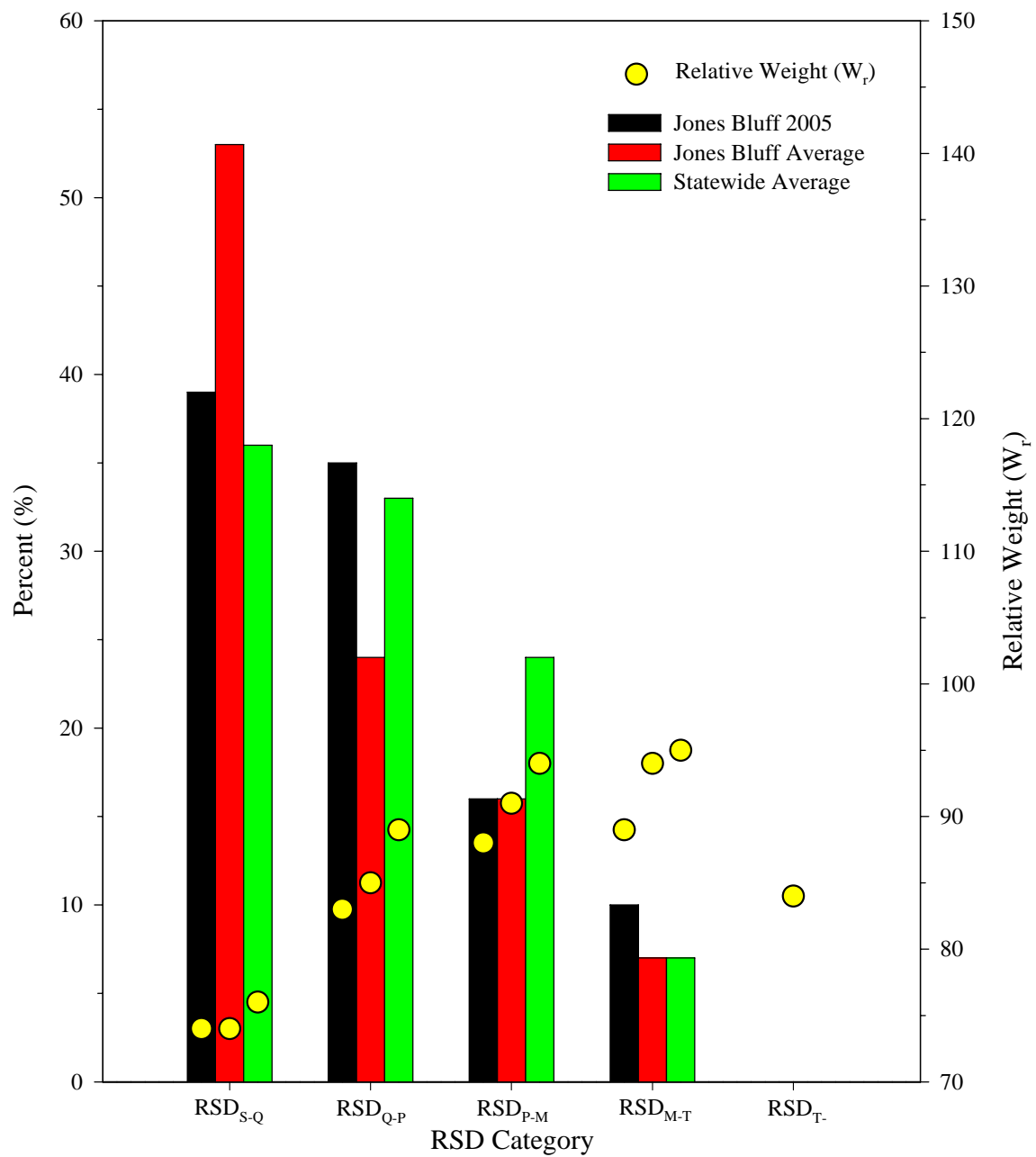


FIGURE 6. - RELATIVE STOCK DENSITY (RSD) AND MEAN RELATIVE WEIGHT (W_r) OF WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

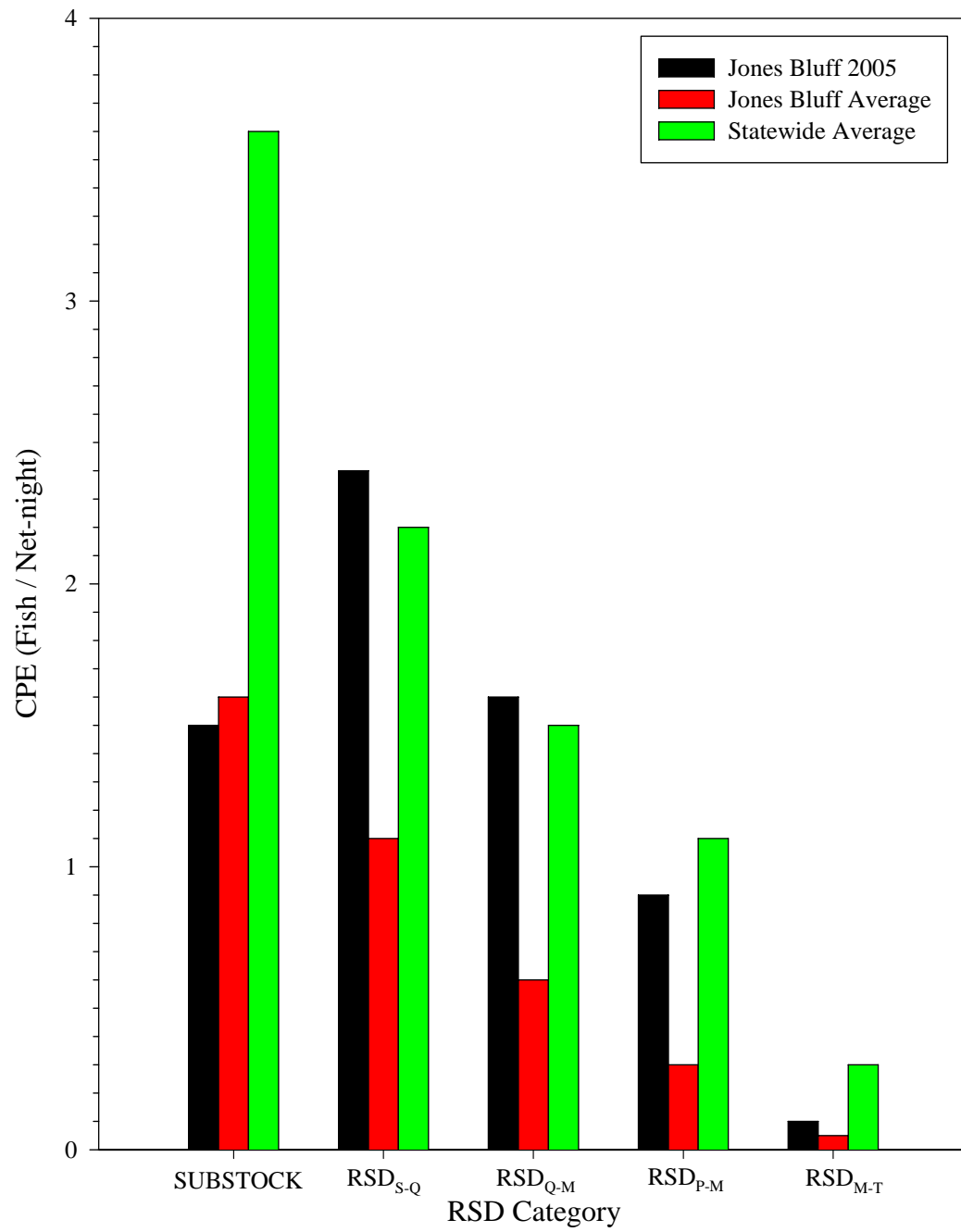


FIGURE 7. - CATCH-PER-EFFORT (CPE) OF BLACK CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.

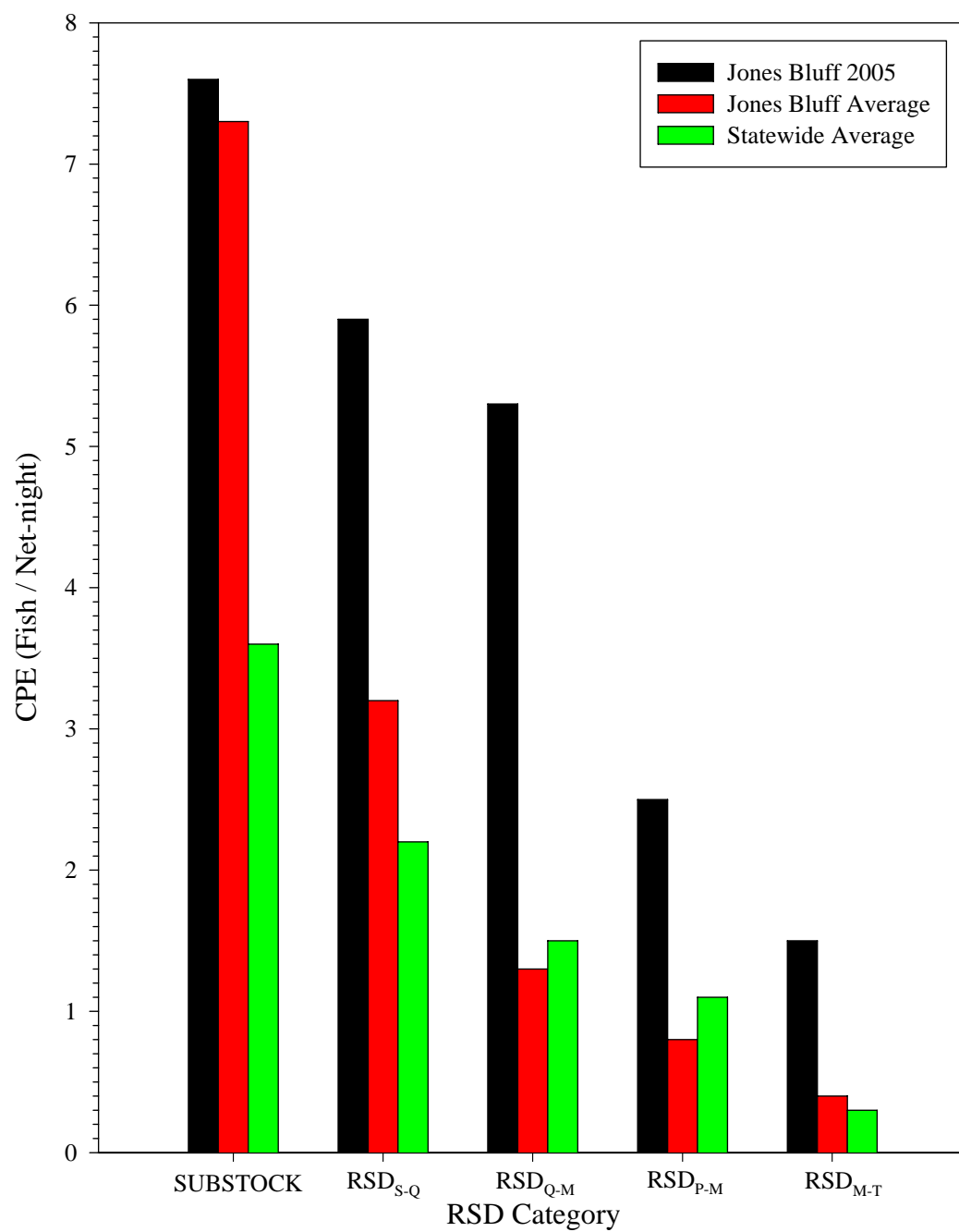


FIGURE 8. - CATCH-PER-EFFORT (CPE) OF WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL, 2005.